sustain the column of blood in it; the capacity of this vein is also greater than that of the mesenteric artery to which it corresponds, and it is one of the vessels whose calibre is most variable, because, from its relation to the digestive organs, it must admit of dilatation when fluids are absorbed, and be enabled to contract when those fluids have passed off. These various obstacles to the portal circulation are counteracted, and the power of accommodating the capacity of the vessel to its contents is insured, by its running in a fibrous sheath, and being quite independent of the tissue of the liver; it can dilate or contract as the quantity of fluid traversing it increases or diminishes, and it can also contract so as to press on the blood it contains, and thus favour its circulation.—*Ibid.*, from *British and Foreign Med. Review.*

3. *Nutrition.*—Professor Paget has elucidated, in a very striking manner, the meaning of an hypothesis of Treviranus, suggesting "that each organ, while it nourishes itself, serves the purpose of an excretion, in that it removes from the blood certain constituents, which leave that fluid in a state more fit for the nutrition of other parts." And in the same degree, it is thought probable "that the consequence of the existence of certain materials in the blood is the formation of an organ, or structure, into the composition of which those materials may enter. For example, when one kidney is destroyed the other often becomes larger, does double work, as it is said, and the patient does not suffer from retention of urine in the blood. The full meaning of which seems to be, that as the principal constituents of the urine are ready formed in the blood, and are separated through the kidneys by the agency—that is, by the development, growth, and discharge —of the renal cells, it will happen that if one kidney be destroyed, there must, for a time, be an excess of the constituents of the urine in the blood; for since the separation of urine is not mere filtration, the other kidney cannot at once, and without change of size, discharge a double quantity. The kidney therefore grows; more renal cells develop, and discharge, and renew themselves; in short, the existence of the constituents of urine in the blood induces the formation of renal substance." By combining these two hypotheses, "firstly, that the blood is definitely altered by the abstraction of every material necessary for the nutrition of a part; and, secondly, that the existence of certain materials in the blood induces, or at least favours, the formation of corresponding tissues, it seems to follow, as a reasonable hypothesis, that the order in which the several organs of the body appear in the course of development, while it is conformable with the law of imitation of the parent, and with the law of progressive ascent towards the higher state of being, is yet (at least in part, and this part more directly) the result of necessary and successive consequences: the formation of one organ, or series of organs, inducing or supplying a necessary condition for the formation of others, by the changes successively produced in the composition of the nutritive material from which they all take their nutriment In other words, the development of each organ or system, co-operating with the self-development of the blood, prepares it for the formation of some other organ or system, till, by the successive changes thus produced and by its own development and increase, the blood is fitted for the maintenance and nutrition of the completed organism." Mr. Paget finds instances of this complemental relation of organs and tissues, in the coincident development of hair on certain parts of the body, and of the genital apparatus. Parallel to which is the perfection of plumage at the period of full activity of the reproductive organs of the bird, particularly the male. And he remarks that as in man, when the development of the genital organs is prevented, that of the beard and all the other sexual characters is, as a consequence, hindered; so in birds, when the breeding season ends, and the sexual organs pass into their periodic atrophy, the plumage assumes paler and more sober colours, characteristic of barrenness. A similar relation is well known in the development of the antlers of the deer and the reproductive organs; and Mr. Paget, in explanation of this connection with development having no apparent purpose in the generation of the species, observes, "that where two or more organs are thus manifestly connected in nutrition, and not connected in any external office, their connection is because one is partly formed of materials left in the blood by the formation of the other; so that each, at the same time that it performs its own proper and external office,

maintains the blood in the condition most favourable to the formation of the other." Lastly, he suggests that in this theory may be found the meaning of the commensurate development of many other organs which in their function appear unconnected; such are the thymus gland and the air breathing organs, the thyroid gland and the brain, the spleen and pancreas, and the embryo and mammary gland of the parent.—*Ranking's Abstract*, vol. vi., from *Paget's Lectures, delivered at Royal Coll. Surg.*, 1847.

4. *Contractility of Arteries.*—E. and E. H. Weber have succeeded in proving, by galvanic agency, the muscular nature of arteries whose calibre is small, but they obtained no satisfactory evidence, from their experiments, of contraction in larger ones. They have employed the rotating electro galvanic apparatus, and have subjected the vessels of the mesentery of frogs to its influence. Arteries of the chosen size, i. e. 1-7th to 1-17th of a line diameter, so acted upon, did not on the instant answer to the irritation, but soon after contracted to a third of their previous diameter; if the irritation were continued, the artery progressively diminished, until the stream of blood-corpuscles was but a single row, or even became interrupted. This narrowing was limited in extent by the range of electric irritation, and produced on the stream of blood a marked acceleration, according to the law of hydraulics observed in diminished tubes. The contraction is only temporary, and the arteries recover completely their normal size and condition, being liable to renewed contraction on a fresh application of the electricity. Capillary vessels, 1-96th of a line in diameter, or thereabouts, exposed to electric stimulus, evinced no contractility, neither were they dilated, but coagulation of the blood was observed to take place. A weak electric stimulus produces, after an interval, a sensible retardation of the stream of blood, which seems to be due to the coherence of the blood-corpuscles, or adherence to the walls of the vessel, with the greater friction of their movement; and this retardation speedily ends in a total stop, whilst the newly-arriving blood-corpuscles accumulate, and fill up the vessel until collateral passages relieve the pressure. After a time the blood-corpuscles disperse once again, and the circulation is restored. A similar retardation and impeding of the circulation are occasioned in minute veins by electric agency, but in these it does not take place with the same facility as in the arterial capillaries, apparently because the stream is less rapid.—*Ranking's Abstract*, vol. vi., from *Müller's Archives*, 1847, No. 2.

5. *On the Nucleus of the Animal and Vegetable Cell.*—By Dr. Martin Barry—Schleiden ascribed to the nucleus of the vegetable elementary cell the power of forming around it a membrane which became the cell-membrane or cell-wall; hence he gave to the nucleus the name of cytoblast. But with the formation of the cell-wall he conceived the function of the nucleus to cease; and thought that, being no longer required, it became inert in the cell-wall, or in some instances was absorbed. The nucleus itself was, in the first instance, produced by a similar mode of development, being deposited around a smaller body, which sometimes remained as a permanent nucleolus. The same view of the formation of cells was advocated in relation to the animal tissues by Schwann, Muller, Henle, and Valentin, the last of whom thus describes the process:—"In a fluid there are precipitated granules, which are nucleoli; around the nucleolus there is deposited a finely granular substance, by which there is formed the nucleus (cytoblast); and around the nucleus there is formed the membrane of the cell. The principle of formation of the nucleus around the nucleolus, is essentially the same as that of the cell around the nucleus."

To borrow the language of the botanist, the preceding physiologists consider the vegetable animal cell to have an "exogenous" development; the primitive nucleolus remaining *central*, and the subsequent formations being deposited layer by layer *around* the nucleolus, which, so long as it remains at all, retains the same relative position. This view Dr. Barry conceives to be incorrect, and propounds a theory of cell-development which corresponds much more closely with the type of structure called in botany "endogenous." Dr. Barry describes the development of the cell as being analogous to that of the mammiferous ovum. According to him the original granule or nucleolus gradually enlarges, and in time de-